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ABSTRACT

This paper describes a study of the teaching effectiveness of computer-assisted instruction using the PLATO system at the University of Illinois in a first level biology course. College enrollment, class rank, final grade, and time study data of the control and experimental groups were obtained from master rosters. A questionnaire administered to the experimental group the last week of each semester provided information on student acceptance of the PLATO method of instruction. At the conclusion of the study, preliminary data indicated that PLATO had the potential to become an effective educational adjunct by: (1) increasing student comprehension of lesson material; (2) actively engaging students in learning processes; (3) significantly reducing the amount of time spent by students on lesson materials; and (4) contributing to higher examination scores. Data tables and graphs and questionnaire items and responses are included. (Author/MH)

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AN EVALUATION OF THE TEACHING EFFECTIVENESS OF PLATO IN A FIRST LEVEL BIOLOGY COURSE

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by

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George H. Kieffer

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ABSTRACT

During the Fall and Spring semesters of 1970-71 a study of the teaching effectiveness of CAI (using the PLATO system at the University of Illinois) was carried out in Biology 100-101, a first level biology course. College enrollment, class rank, final grade, and time study data of the control and experimental groups were obtained from master rosters printed by the University and records kept in the course. A questionnaire administered to the experimental group the last week of each semester provided information on student acceptance of the PLATO method of instruction.

At the conclusion of the study, preliminary data indicate that PLATO has the potential to become an effective educational adjunct by: 1) increasing student comprehension of lesson material; 2) actively engaging students in learning processes; 3) significantly reducing the amount of time spent by students on lesson materials; and, 4) contributing to higher examination scores.

I. INTRODUCTION

The use of PLATO at the University of Illinois extends into several disciplines, including languages (French, Russian, Spanish, and Latin), physical sciences (chemistry and physics), technical studies (electrical engineering, theoretical and applied mechanics, mathematics, and architecture), and biologically-oriented courses (biology and veterinarian medicine). In addition to whole courses where primary instruction is by means of PLATO, many single lessons and short topics have been prepared in the diverse fields of sociology, economics, demography, psychology, political science, and graphic arts.

Specifically in the biological sciences, PLATO has been used extensively in only two courses: Biology 100-101 (Biology for Non-majors) and Biology 115 (Heredity, Evolution and Society). However, no in-depth study has been made in either course evaluating the effectiveness of computer assisted instruction (CAI). During the Fall and Spring semesters of 1970-71, an effort was made to evaluate the teaching effectiveness of CAI in Biology 100-101. Specifically, the questions addressed were these:

1. Is PLATO an effective means of instruction?
2. Does the use of PLATO have a significant influence on final grades received by students?
3. Are there any specific types of PLATO presentations that are more effective than others in transmitting lesson material?
4. Does the use of PLATO have an influence on the amount of time spent by students in learning material?
5. What are student opinions regarding learning by means of CAI?
6. Would it be desirable to continue the experimental use of PLATO in Biology 100-101?

II. EXPERIMENTAL DESIGN

A. General

Biology 100-101 at the University of Illinois is taught primarily by means of the audio-tutorial (A/T) method with separate quiz-discussion sections to evaluate student understanding of material*. The course, administered as a modified form of independent study, is well suited for testing the effectiveness of CAI materials since computer-based instruction has the potential to contribute to the pedagogical method normally employed. Both the experimental and control groups covered the same topical material, attended the same lecture sections (G. A. S.) and were tested in regular quiz-discussion sections. The experimental group students had no special considerations either in terms of course content or requirements other than the use of PLATO for certain aspects of the course material. PLATO students went unidentified in the normal course routine.

In the Learning Center, PLATO students had access to programmed material. Conventionally (the control group) the main body of information is presented on individual recorded tapes the playback being under the control of the student. Tapes average 50-60 minutes in length with one covered per week. Information, correlated to a particular topic, is introduced from readings, experiments, demonstrations, video-tapes and films. The PLATO group used a modified form of the taped information. Some of the material on the conventional tape was programmed on PLATO, being omitted from the student tape. The programmed material was mainly factual in nature while discussion-type material remained on the student tape. Transitional phrases on both the tape and PLATO guided

*For a more complete description of Biology 100-101, its structure, goals and philosophies, see: Kieffer, G. H., "Toward a Biological Awareness", CUEBS News, Volume VI, Number 4, April 1970, Washington, D. C.

the students among the topics presented by each mode. Thus, topics and materials in each lesson remained the same for both groups, only the way in which material was presented differed.

B. Selection of the Experimental Group and Control Group

During the first general meeting of the course, an invitation was extended to all students to attend a special meeting on CAI and the PLATO system in Biology 100-101. A group of 24 students was randomly selected from some 50 original applicants. No effort at preferential selection was made. Thirteen of the original 24 students selected in the Fall continued with the PLATO program in the Spring semester. Students taking instruction through normal course procedures constituted the control group.

C. Collection of Data

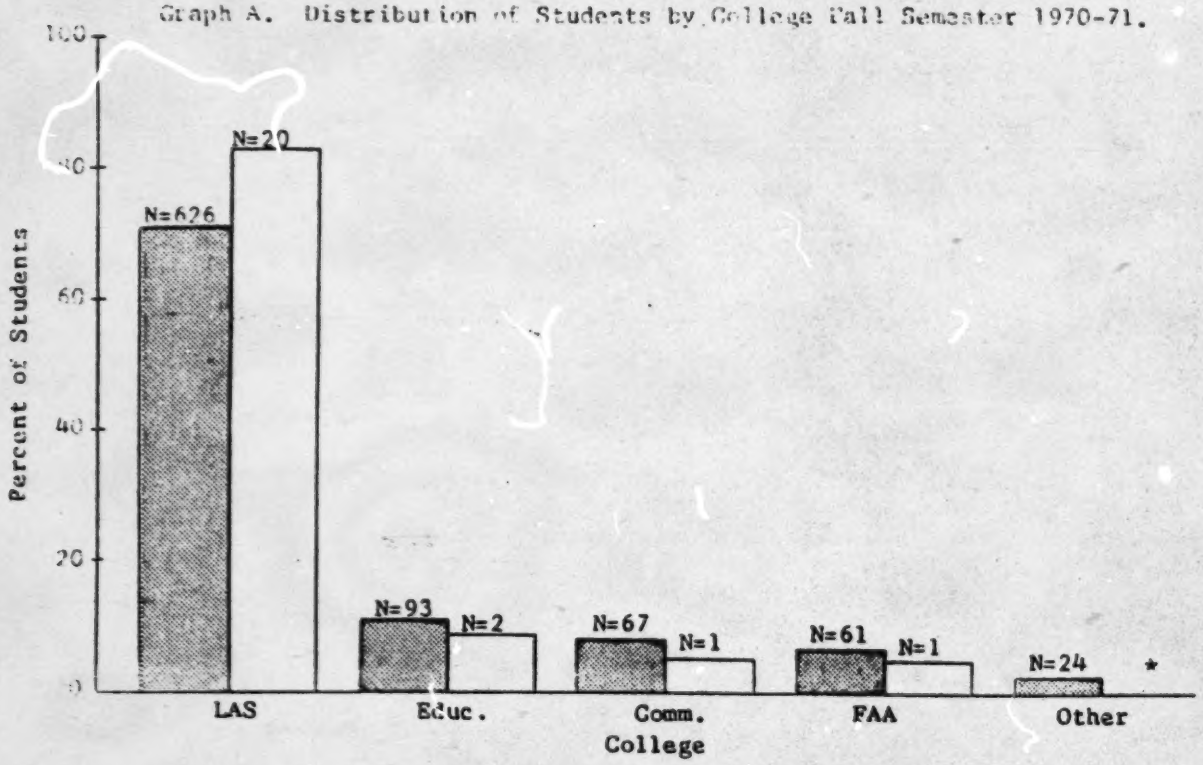
Various comparisons of the two groups were main objectives of this study. Information on college enrollment and class rank was obtained from the Biology 100-101 master roster printed by the University. Final grade data came from individual student cards kept in the course. Information for the time study came from log cards used by students to check into and out of the Learning Center for each week's lesson.

Experimental group students' responses to questions concerning CAI and the PLATO program came from questionnaires administered during the last week of the first semester (sixteenth week of study) and the last week of the second semester (thirty-second week of the study). The questionnaire was designed to yield information on four major areas of interest: 1) types of programmed presentations, 2) technical-mechanical opinions (not stressed in this report), 3) student opinions on educational value of CAI, and 4) specific student opinions on PLATO and the Biology 100-101 program. Added oral information came from informal discussion sessions held once each semester.

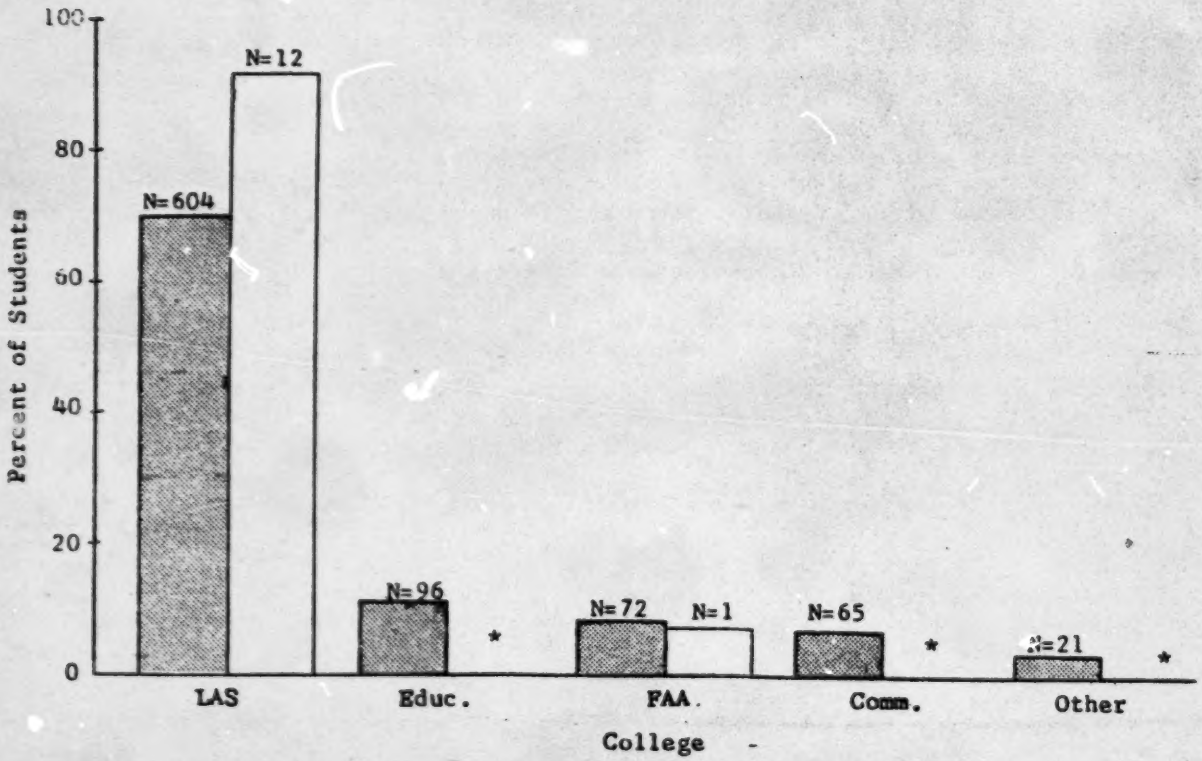
III. DATA-RESULTS

A. Comparison of Control and Experimental Groups (Control Group: shaded bars; Experimental Group: unshaded bars; asterisk indicates no data in catagory.)

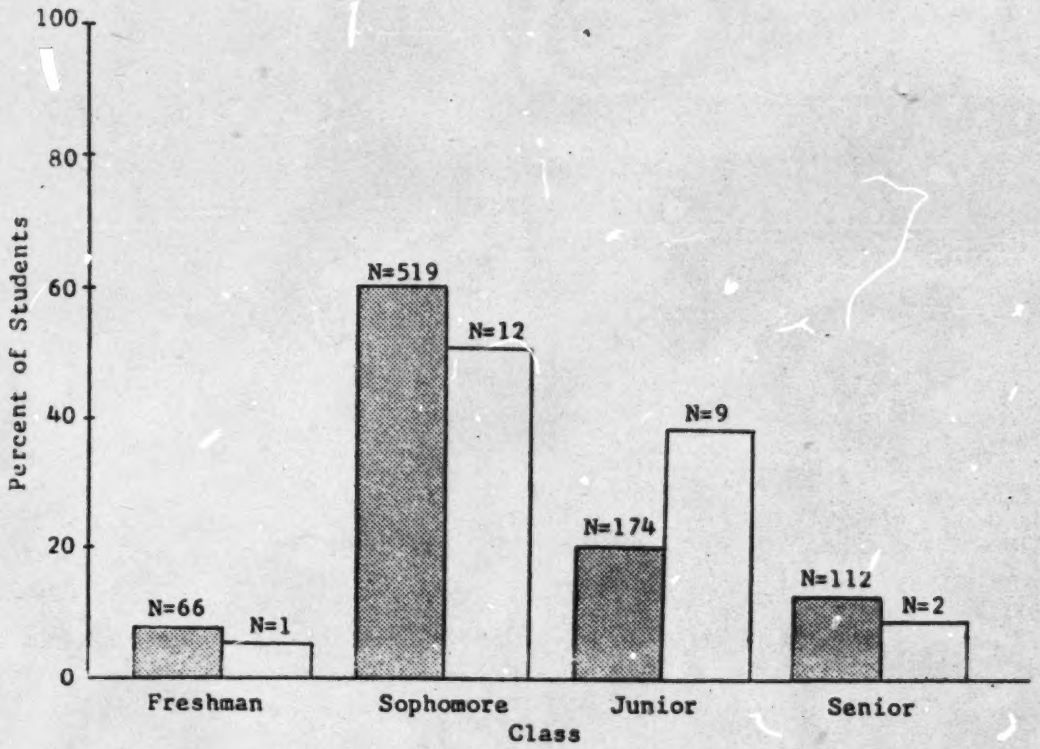
Graph A. Distribution of Students by College Fall Semester 1970-71.



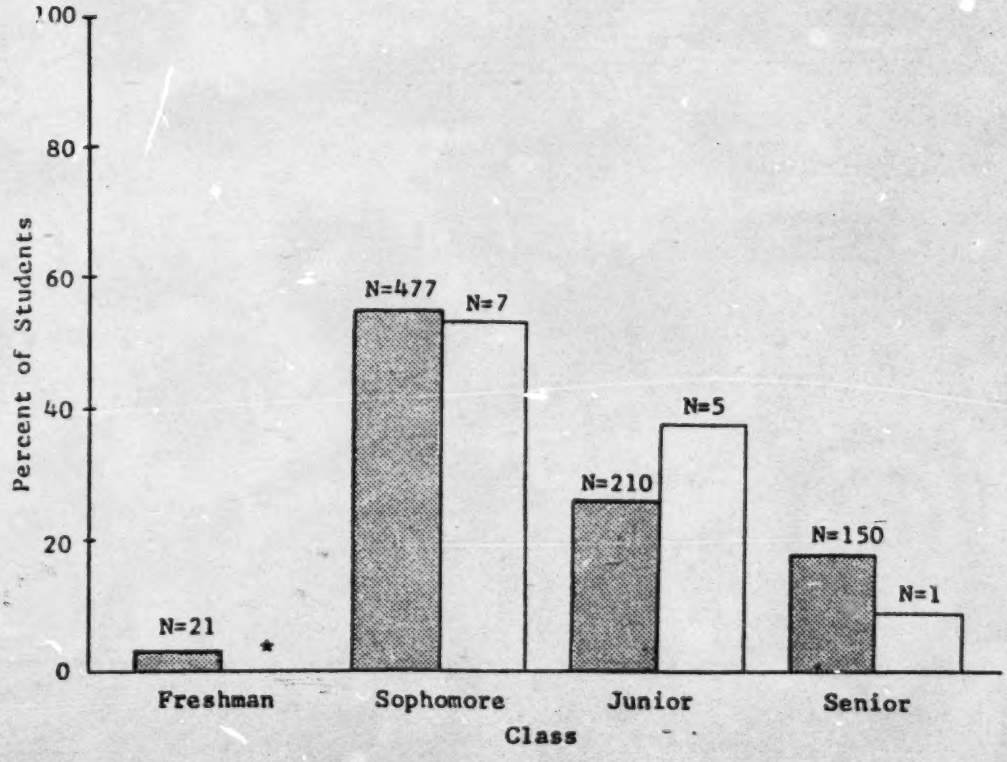
Graph B. Distribution of Students by College Spring Semester 1970-71.



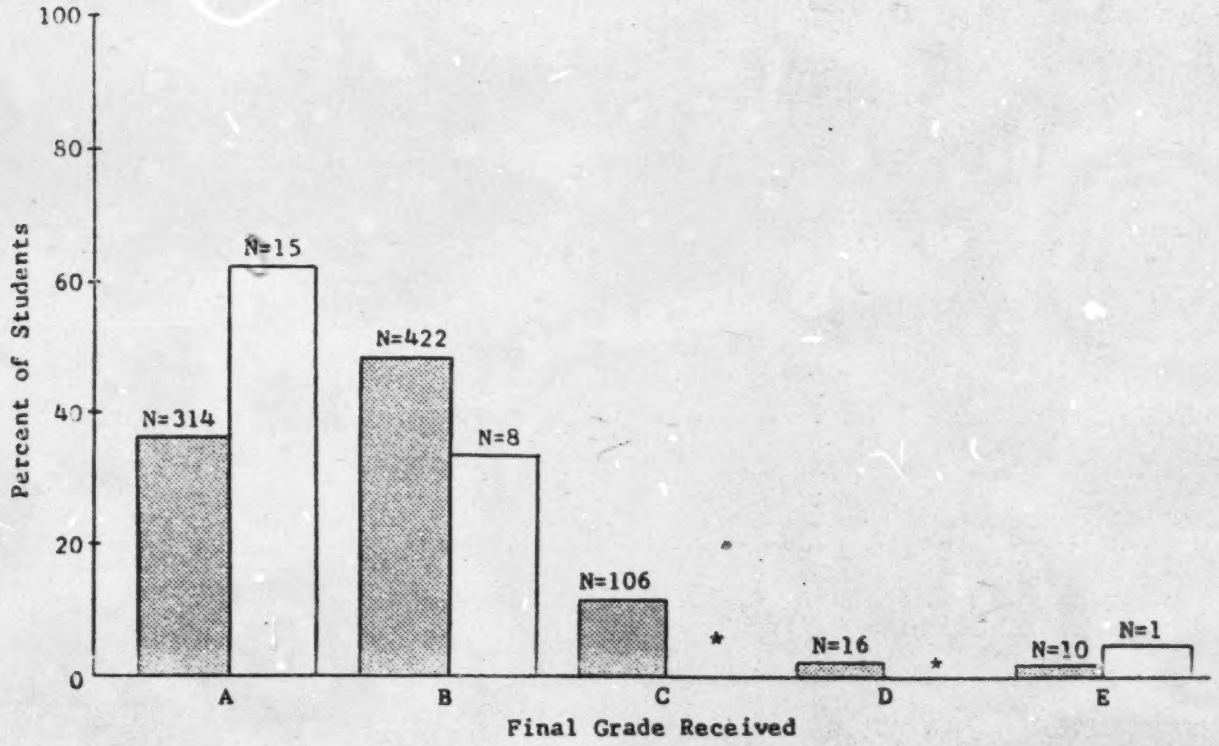
Graph C. Distribution of Students by Class Fall Semester 1970-71.



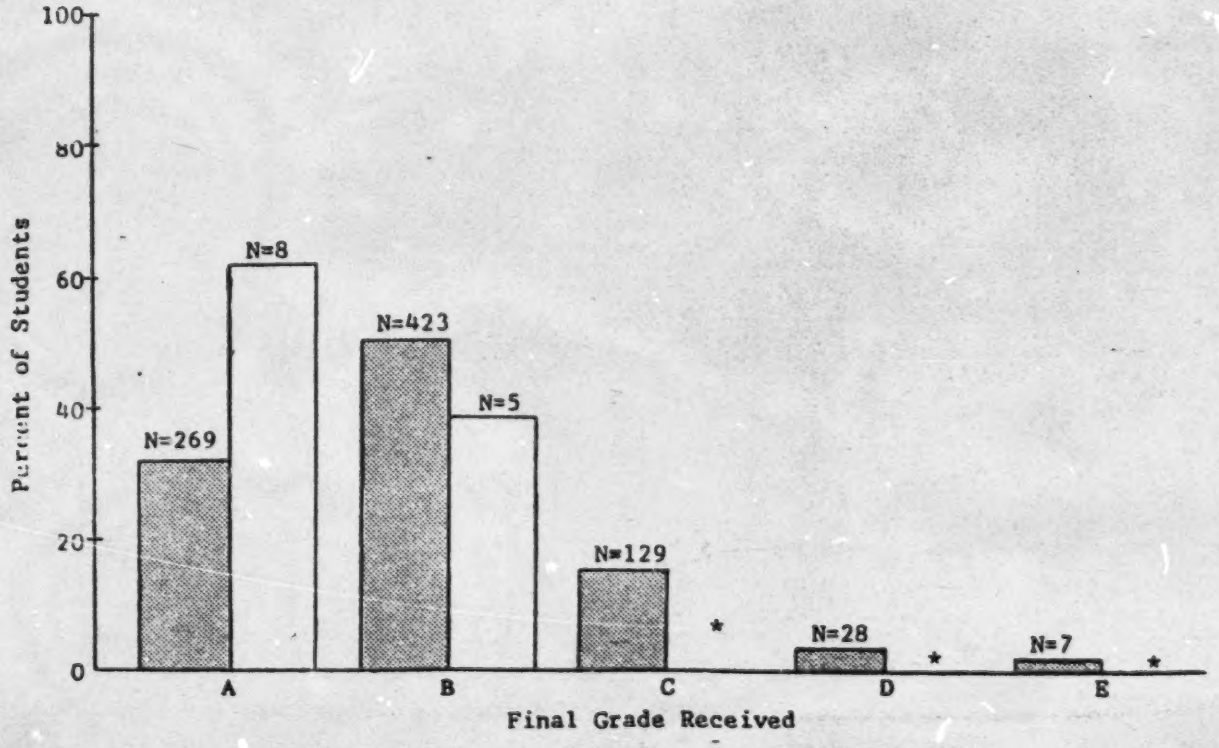
Graph D. Distribution of Students by Class Spring Semester 1970-71.



Graph E. Distribution of Final Grades Fall Semester 1970-71.



Graph F. Distribution of Final Grades Spring Semester 1970-71.



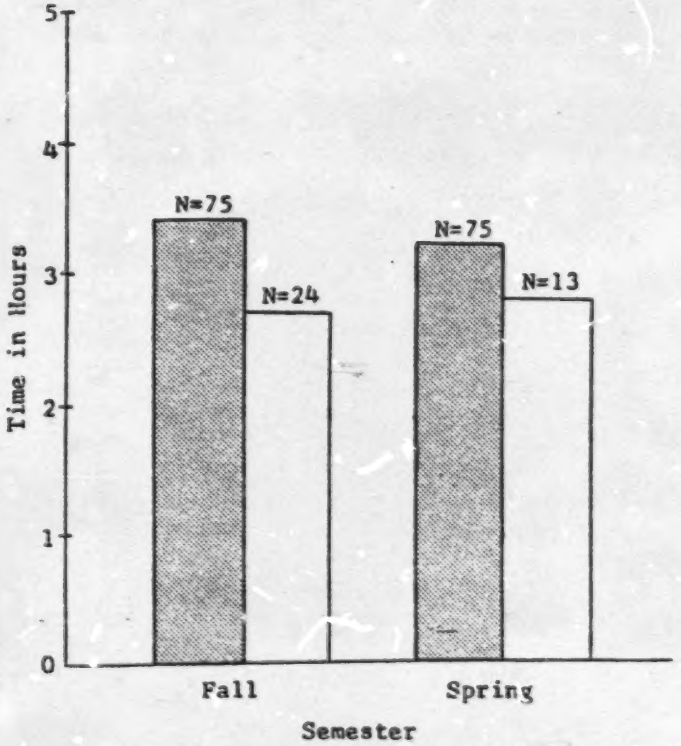
B. Time Study Comparisons

Table 1. Average Time Spent Per Lesson in Learning Center*.

Group	First Semester	Second Semester
Control	3.41 hours [3 hours 25 min.] (N=75)	3.17 hours [3 hours 10 min.] (N=75)
Experimental	2.63 hours [2 hours 38 min.] (N=24)	2.78 hours [2 hours 47 min.] (N=13)

* Includes time spent performing experiments, reading literature, listening to tapes, (PLATO for experimental group), etc. Determined by checking time-log cards used by students in Learning Center.

Graph G. Average Time Spent Per Lesson in Learning Center



IV. DISCUSSION-EVALUATION OF DATA

A. Analysis of Groups, Final Grades Received, and Time Study.

It should be noted from the start that the Biology 100-101 sequence is offered mainly to fulfill general education requirements for several colleges at the University and therefore is organized with the non-major in mind. Consequently, none of the students were enrolled in Biology 100-101 as biology major or minors.

Due to the limited number of PLATO outlets in the Learning Center, the experimental group was small. The maximum number of students that could be accommodated in the program was 24 (reached during the first semester). The size of the PLATO group decreased from 24 to 13 students second semester due primarily to class conflicts in scheduling. In addition to conflicts in scheduling, three students elected not to enroll in Biology 101 and one student withdrew from the University. It is recognized that the small number of students using the PLATO method presents some problems when comparisons with those not on PLATO are made.

1. Student Make-up of Control Group and Experimental Group.

As Graphs A and B indicate, both the control and experimental groups had similar distributions of students according to college enrollment each semester. The outstanding point on each graph is the predominance of students enrolled in various LAS curricula. The effects on data (mainly final grades) of such a large number of students from one college were uncertain, but were not expected to be of major importance since all students were non-majors and probably had similar aptitudes and attitudes toward a course outside their main area of interest. This belief was borne out, but, not being of direct relevance to this report, has been summarized in Graphs X1 and X2 in the Appendix.

When compared on a class-constituency basis (Graphs C and D) both groups again displayed similar distributions of students. Another unusually large segment of students (the sophomores and juniors) comprising about 80% of the total each semester was evident. Graphs X3 and X4 in the Appendix indicate that little significance could be placed on comparison of class rank and final grades and, hence, was not believed to affect later discussions of this report.

Basically then, though the actual percentages differed, each group had similar student compositions of college enrollment and class rank, and further, these compositions by themselves did not seem to lend any bias toward receiving a specific grade.

2a. Final Grades Received.

Direct comparisons of final grades between the control and experimental groups on a college-college or class-class basis were not possible because of the small number of students in the classifications within the experimental group. However, because of the similarities of student make-up of the two major groups already established, and the apparent negligible influence on final grades, a general comparison of final grades between the control and experimental groups (i.e. those who did not use PLATO versus those who did use PLATO) could be made.

At the conclusion of the first semester, analysis revealed that the experimental group received 27% more A's, 15% fewer B's, and 12% fewer grades lower than B (Graph E). Clearly, the experimental group performed better academically than the control group.

In connection with final grades of the experimental group first semester, it was observed that one student received a failing mark. This single failure was explained by the fact that the student was present for only one-third of the PLATO sessions and was absent for over one-half of the quiz-discussion

sections. The reason given by the student for excessive absences was personal problems and she did not enroll in Biology 101 the second semester. It was felt that this failure does not reflect on the PLATO program itself, and is included here only for completeness.

Second semester final grades showed the experimental group with 31% more A's (twice the percent of the control group), 11% fewer B's, and no grade lower than B (Graph F). Again, the experimental group demonstrated superior proficiency.

2b. Possible Reasons for Better Performance of Experimental Group.

One of the major objectives of this study was to determine if PLATO had any significant influence on final grades received by students. The exceptionally high percentage of A's and B's acquired by the experimental group both semesters would tend to substantiate the hypothesis that PLATO DID have a POSITIVE effect on learning.

Several reasons for enhanced achievement might be suggested: first, lessons on PLATO were constructed on the basis of MASTERY LEARNING. With this type of learning it was almost impossible for students to advance to a further topic in a lesson until the earlier one was "mastered". Further, by employing branched programming, each student was able to study the material at a level commensurate with his ability or background. Second, the material itself on PLATO was programmed to be presented in precise and often unusual ways to encourage high student interest.

In addition, superior performance by students on PLATO may have been due to several parametric variables of the experimental group and program that could not be dismissed out-of-hand.

First, the small size of the experimental group may have produced misleading data on final grades. With such a small number in the PLATO group,

the probable inclusion of students with high levels of intelligence may likely have prejudiced the final grade data upward.

Second, although the students for the experimental group were chosen "at random", the selection was made from a group of volunteers, which, though not validated, probably consisted of students who were highly motivated academically, desirous of participating in an experimental program, and/or readily eager to try something unusual in education. Curiosity probably played a large role also, judging from several comments at the first general meeting to the effect that: the student "was interested in computer science and wanted to see how computers might be used in education". So, from the start, the experimental group was probably composed of an exceptional type of student, enthusiastic over, or at least curious about, computer assisted instruction.

Finally, throughout much of the experimental program, the "Hawthorne Effect"* very probably influenced student behavior. Studies have shown that participants in experimental situations often perform better not because of the parameter being tested but rather because of the experiment itself; i.e., recognizing oneself as part of a unique group in an unusual circumstance and thus prejudicing the data. However, it was believed the Hawthorne Effect likely would have diminished to a large extent by the end of the second semester (32 weeks of the experimental program) and student behavior with PLATO would have become "routine". Yet, questions concerning the educational use of PLATO (administered during the sixteenth and thirty-second seeks) received student responses that would contradict this conclusion; in fact, the principle negative comments from the students pertained to the technical and programmatical

*Roethlisberger, F. J. and Dickson, W. J., Management and the Worker, Harvard University Press, Cambridge, Mass., 1939.

aspects of PLATO rather than its educational facets. The students were apparently as enthusiastic about using PLATO at the end of the experimental program as they were at the start. It should also be noted that students were not "overwhelmed" by the program itself, and their responses indicated they were able to distinguish specific points in the program and could be critical in their evaluation of these.

To what extent these parametric variables, individually and collectively, influenced the data concerning final grades could not be determined with certainty; however, at one point or another in the course, each probably did.

3. Time Study.

One of the objectives of this study was to determine if PLATO affects the time needed to complete the lesson material. It would appear this is the case, for the experimental group spent 47 minutes less per lesson the first semester than the control group and 23 minutes less the second semester (Table 1 and Graph G). Again, however, it can't readily be determined to what extent parametric variables such as student aptitude or interest influenced the results, since, within both the control and experimental groups individual students spent as much as 7 hours per lesson or as little as 1 3/4 hours per lesson.

There was a positive relationship when the amount of time PLATO was in operation for each lesson was compared with the amount of material presented in each lesson. The first semester was more technical or factual in its approach to biology than second semester and it was during this semester that much of a lesson's material appeared on PLATO. Second semester was more philosophical and the implications of biology on society were stressed. PLATO was employed more for gaming and the study of hypothetical problems with the quantitative amount of material on PLATO being reduced. The manner in which

the PLATO students received information second semester more closely approximated the way in which the control group received theirs. This closer approximation was reflected in less time being saved by the experimental group. Though it can be argued whether PLATO substantially reduced the amount of time spent on lessons the second semester, it would be difficult to deny that a saving of 47 minutes per week (lesson) first semester was a considerable reduction.

B. DISCUSSION-ANALYSIS OF QUESTIONNAIRE RESPONSES.

1. Types of Lesson Presentations.

Student preferences for the ways in which material was presented were quite variable. Generally, however, the most preferred lesson approaches tended to be those that required an involvement, activity, or analysis on the part of the student. These included such methods as programmed experiments with a wide latitude of manipulative variables, "games" which described some biological phenomenon, inquiry involving question-probing to arrive at a solution, programmed branching of material within lessons (rather than linear-sequential presentation), and slide animation depicting various biological or chemical changes over a period of time. Most students felt that these types of presentations should be increased in number and expanded in scope.

Surprisingly, the students also highly valued simple fact presentation. Although it cannot be ascertained with any degree of certainty, this preference for fact presentation likely may have been due to the programming itself, since limited word space in the computer forced written material to be concise, sequentially logical, and "to-the-point". A prevailing student attitude of "give me the facts, and let me go" was not apparent from oral or written

responses, rather, time and again, phrases such as "... [the] material was much clearer on PLATO", "...the clarity and brevity with which the material was presented", or "... [PLATO] helps to see things not clear on the tape" were in evidence.

Of lesser importance to students were presentations of single slides only and slides accompanied by taped dialog. Students also felt that contingency type sequences based on the -HELP- and -TERM- keys were of value and should be increased in future programs.

2. Student Appraisal of Their Performance in Class.

When the experimental group students were asked if they felt at any disadvantage in quiz sections with control group students, they were almost unanimous in their assertion that they were not. In fact, most of the group stated that they felt an advantage and preparedness over control group students.

This is an important point, because it is in the quiz sections that a student demonstrates his understanding of the week's material both orally and in writing. It does not matter how the student obtained his understanding of the material, be it tape, readings, experiments, diagrams or PLATO, he is expected to be able to transmit this comprehension during the oral discussion to his fellow students and instructor, and later, to the instructor alone on a written objective quiz.

The fact that the experimental group students felt so well prepared on the material, demonstrated superior understanding of the biological phenomena in quiz section, and received consistently higher academic grades, indicates that though PLATO might not have been the main underlying reason for this excellence, it apparently did contribute substantially to the students' comprehension of the subject matter and their classroom performance.

3. Student Opinions on Educational Aspects of CAI.

The experimental group was unanimous in its enthusiasm for PLATO as an educational tool. More importantly, PLATO students found that the PLATO method involved them directly in the learning process, clarified difficult ideas, and increased their attention. PLATO presented information only as long as the student actively participated by pressing keys, and the student could not "get by" with only a partial understanding of the material because strategically placed and worded questions continously evaluated the student on his understanding of the information. If it became "apparent" to PLATO that the student did not understand a topic, it "behaved" as an ideal mentor by pointing out errors, giving help, and presenting praisworthy comments before allowing the student to progress to the next section of material.

When asked the question, "Do you think you learned information using PLATO?", the students responded in total agreement that they did. It was hardly possible for them not to learn information on PLATO because of the educational design of the programs discussed above.

Finally, a question pertaining to the "future" of PLATO in education drew favorable answers from all the responding experimental group students without exception. While some conditional statements made by a few students to this question indicated that they would not like courses taught solely by PLATO, other statements seemed to express the opposite opinion.

4. Student Opinion of PLATO and the Biology 100-101 Program.

Some of the most interesting student reactions and opinions of this study came from questions which directly applied to PLATO and the Biology 100-101 CAI program in its relationship to the learning process.

More than half of the experimental group considered PLATO to be a "gadget" at the beginning of the experimental program in September. Yet, hardly a student considered it a gadget by the end of the first semester of use. Some comments to the effect include: "Absolutely not...", "...very valuable as a tool for learning.", "...a fantastic way to learn.", "...a great learning tool". Even the few who still believed it to be a gadget, however, referred to PLATO in very favorable terms: "...a very good, useful educational tool...", "...I really believe it is very helpful...", "Only in the sense that it is still 'fun' to use...", "...more of a tool than a gadget...".

As for the students' opinion of the value of using PLATO in Biology 100-101, they were unanimous in believing it to be a worthwhile experience for them. They had diverse reasons, however, for this consideration: some felt it was the visualizations on the computer, some the clarity of presentation, and still others, the interesting or unusual manner in which material appeared. When the same idea was asked in a negative context ("Did you find PLATO a waste of your time?"), the students replied emphatically that it was NOT. Such overwhelmingly favorable responses would tend to indicate that the use of PLATO in Biology 100-101, as measured by student acceptance, was successful.

Another consideration of the estimable value of PLATO as used in the course was: would students have enrolled again in the CAI program, knowing first-hand the pitfalls and shortcomings of the first exploratory attempt? Unanimous acceptance was again evidenced in the student responses.

In further support of the use of PLATO as a teaching aid in biology, it should be pointed out that a substantially large number of the experimental group indicated they would choose to take more biology courses which used PLATO, and most students also responded affirmatively to the employment of PLATO

in courses other than those biologically oriented. Of specific importance, however, since quite a few students made note of it in the questionnaire, is the conviction that PLATO should not become the sole method of information dissemination. At least two reasons might be given: 1) the need for interaction with other human beings on a personal basis in the discussion section and in the Learning Center; and, 2) the desirability for varying the method of instruction. This opinion by some students lends credence to the suggestion of many educators that CAI holds great promise as an adjunct to learning but should not be considered an educational panacea that will replace other methods of teaching.

It is essential for learning that students feel they are gaining valuable information from a particular educational method. It little matters how interesting, unusual or reliable that method is, if the students don't believe it's "teaching" them. In this study, students had high regard not only for PLATO's ability to present material, but also that the material was presented in such a way that they could learn from it.

One final basis for assessing the success of this experimental program has been: Do the experimental group students consider their overall experiences with PLATO valuable enough to continue its use in Biology 100-101? In total agreement, the students responded that with perhaps minor alterations in the program, they would encourage its inclusion as an integral part of the course.

5. Time Scheduling.

The experimental group students were about equally split in their opinions concerning the "rigid" time schedule with 8 favorable comments, 8 negative and 1 non-commital the first semester, and 6 favorable, 6 negative and 2 non-commital

the second semester. Those who favored the time schedule felt that, generally, it reduced some of the "hassle" inherent in operating a course which has as many students as Biology 100-101 does. They appreciated the availability of carrels reserved for their use, the easy access to materials with no waiting period, and the ability to set up a scheduled routine around other courses they were taking. In general, those students with negative comments about the "rigid" scheduling were disturbed by being cramped for time. Some felt the time of scheduling conflicted with other classes immediately before or after the appointed time. And a few independent souls were simply opposed to any regimentation of their time.

It should be pointed out, that at NO time were the students penalized for not completing the material in the allotted period. They were invited to come to the next scheduled PLATO section or were allowed to finish the material in the conventional way.

C. GENERAL REMARKS.

1. Technical Aspects of the Biology 100-101 PLATO Program.

Almost to a person, the experimental group students pointed out the technical problems of the PLATO III system, and it must be agreed that this was perhaps the single most distracting element of the program for the students. The images on the cathode ray tubes used with the PLATO III system had a tendancy to become faded, blurred or "fuzzy" with extended periods of use. The student terminals used were linked by telephone lines to a CDC-1604 computer located two blocks away. It was not the distance itself (some remote sites are up to 90 miles away) that caused the problems, but difficulties in the connections between the two sites. Technical problems of this nature should be minimized with the implementation of PLATO IV and plasma display panels.

2. Problems in the Biology 100-101 PLATO Program.

Of the many problems encountered in the presentation of course material on PLATO, the most perplexing was a lack of time by the programmer for the production of high quality lessons. (High quality, as used here, is purely a subjective evaluation taking into account the lesson content, imaginative representation, clarity of presentation, sophistication of programming, and flexibility of lesson design.) Experience has taught us that a lesson containing all or most of these requisites demands a considerable amount of time to prepare. In general, a one hour computer lesson involves between 50 and 70 hours of preparation time. The preparation of one lesson per week exerted a heavy pressure on the programmer's time and frequently quality had to be compromised.

3. Did PLATO "Teach"?

The rather subjective responses of participants as well as the final grades earned by them indicate that PLATO probably did. Generally, PLATO participants:

A. felt they learned information from PLATO;

B. reported they enjoyed learning from PLATO;

C. believed their participation in the PLATO program to be a worthwhile experience;

D. were convinced that PLATO was a desirable educational method;

E. felt they were better prepared over the material;

F. demonstrated a high level of understanding of material in formal quiz sections.

4. Where Do We Go From Here?

The experimental Biology 100-101 PLATO program will be continued during the 1971-72 scholastic year. Some additions and modifications of the overall program that are planned include:

A. developing and programming of new lessons;

B. changing and rewriting of existing lessons;

C. adding to and redesigning of the questionnaire to provide more objective data;

D. seeking out and engaging in the PLATO program a more representative distribution of students enrolled in the course.

Besides changes to be made <u>within</u> the Biology PLATO program, it is hoped that extra-course communication will be increased to inform others of developments and progress of the program. This communication might take the form of small discussion sections, seminars or demonstrations, the objective being to acquaint non-users of CAI in Biology with PLATO and to create an interest and participation in development in related areas.

These first indications on the use of PLATO in Biology 100-101 have demonstrated the potential educational value of the system. It would seem that its inclusion as a tool in areas in the School of Life Sciences should be studied.

V. CONCLUSION

Based on the initial objectives of this study, the following preliminary conclusions might be stated based largely on the empirical data:

1. PLATO has the potential for being a superior means of instruction.
2. PLATO students as a group had higher examination scores as judged by final grade distribution.
3. Direct student-involvement in learning activities enhances achievement and interest.
4. PLATO significantly reduces the amount of time spent by students on lesson material with no measurable sacrifice in proficiency.
5. Student-acceptance of the PLATO method was very high.
6. Continued development of CAI in Biology 100-101 would be desirable. Among others, the following objectives should be considered: A) to further develop the Biology 100-101 PLATO program for the purpose of collecting more information in regard to the value of CAI and its application as an effective instructional method; B) using this lead-time in preparation for full participation in PLATO IV (in 1972 or 1973).

APPENDIX

A1. PLATO Questionnaire Responses Fall Semester 1970-71.

1. QUESTION:
Did you find simple fact presentation (reading) on PLATO:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	13
B. helpful	2
C. not very helpful	0
D. totally useless	0

2. QUESTION:
Do you think that the amount of simple fact presentation on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	9
B. be decreased	0
C. remain the same	6

COMMENTS

I would like it better if the material could be presented with more of the question and answer style, that is, with a short essay and then questions covering it and possibly learning further material solely through question probes.

3. QUESTION:
Did you find question-answer type of material on PLATO:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	12
B. helpful	3
C. not very helpful	0
D. totally useless	0

4. QUESTION:
Do you think the amount of question-answer material on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	11
B. be decreased	0
C. remain the same	4

5. QUESTION:
Did you find the use of slides (not slide animation) on PLATO:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	7
B. helpful	4
C. not very helpful	4
D. totally useless	0

6. QUESTION:
Do you think the number of slides used on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	8
B. be decreased	2
C. remain the same	5

7. QUESTION:
Did you find the use of animated slide sequences on PLATO:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	10
B. helpful	0
C. not very helpful	4
D. totally useless	0

COMMENTS

They were not only helpful, they also made the course more interesting

I found the animation to be not only helpful but an interesting way of presentation.

8. QUESTION:
Do you think the number of animated slide sequences on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	11
B. be decreased	2
C. remain the same	3

9. QUESTION:
Did you find the simultaneous use of slides with Dr. Kieffer presenting information on the tape:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	5
B. helpful	6
C. not very helpful	5
D. totally useless	0

10. QUESTION:
Do you think the number of slide-discussion types of presentation on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	7
B. be decreased	3
C. remain the same	6

11. QUESTION:
Did you find the use of inquiry (a series of questions and answers which lead to a hypothesis) on PLATO:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	10
B. helpful	4
C. not very helpful	1
D. totally useless	0

12. QUESTION:
Do you think the use of inquiry on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	9
B. be decreased	0
C. remain the same	6

13. QUESTION:
Did you find the use of programmed experiments (such as the respirometer experiment) on PLATO:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	8
B. helpful	4
C. not very helpful	2
D. totally useless	0

COMMENTS

It was nice to do the experiment that way, it was also easier. However, you didn't really learn about the method or equipment.

I found the experiments on PLATO to not only be very helpful but also much more interesting than the normal lab experiments. The PLATO experiments could be repeated many times allowing the student more chances to gain a better understanding of the purpose of the experiment.

14. QUESTION:
Do you think the number of programmed experiments on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	12
B. be decreased	0
C. remain the same	4

COMMENTS

I really liked doing experiments on PLATO. Definitely there should be more of them.

The experiments offered were exceptionally fine. There should definitely be more experiments done on PLATO.

15. QUESTION:
Did you find the use of help sequences (-HELP- key):

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very adequate	3
B. adequate	7
C. inadequate	3
D. very inadequate	1

16. QUESTION:
Do you think the use of HELP sequences on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	8
B. be decreased	0
C. remain the same	6

17. QUESTION:
Did you find the use of comments (such as "Very good", "Excellent", "That's not correct", etc.):

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very adequate	6
B. adequate	10
C. inadequate	0
D. very inadequate	0

COMMENTS
It would be more amusing if more comments were given.

18. QUESTION:
Do you think the use of comments on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	11
B. be decreased	0
C. remain the same	5

COMMENTS
They give you a sense of accomplishment and they make the lesson seem more personal than it would be without them.

19. QUESTION:
Did you find the use of branching sequences (either for added help or to skip parts of the lesson):

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	13
B. helpful	3
C. not very helpful	0
D. totally useless	0

20. QUESTION:

Do you think the use of branching sequences on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	12
B. be decreased	0
C. remain the same	5

21. QUESTION:

Did you find PLATO too impersonal?

RESPONSES:

No, I didn't expect PLATO to be personable. I found that I could go through the material at my own rate (that is the material on PLATO). The material in the tape had only one speed of dispersing the material. I found this advantage in using PLATO, that a student can go at his own learning rate.

No. In fact, I think PLATO is much more personal than just listening to the tape. We are questioned, and we have to give the correct answer before we are allowed to continue. On the tape, you have no idea if you actually understand the information, and you just hope that you are getting it.

I don't think PLATO is any more impersonal than the tape or a regular lecture. In fact it is more personal because it responds with immediate feedback and comments.

No. The tape alone would not be very personal, and the comments, "OK", etc. make PLATO more personal than the tape could be.

No, but it was very frustrating when some of my questions couldn't be answered on PLATO. I would have liked more material presented on PLATO.

No, because of the little comments that followed answers it seemed like PLATO really knew what was going on.

I thought I would, but found I enjoyed it very much and the comments were excellent, etc. It helped make it seem more "human".

No, because the comments made by PLATO made him seem like I was speaking to a real person.

No, after a while I kind of regarded it as I regard a TA.

No, I felt it was not impersonal with Dr. Kieffer talking between topics.

7 no's.

22a. QUESTION:
At the beginning of the semester, did you consider PLATO a gadget?

RESPONSES:

No, I considered PLATO a learning device which I had read about and now had an opportunity to use.

At the very beginning (one or two lessons) until I got used to the TERM, NEXT, etc. buttons, I was a little bit uneasy with the mechanics of PLATO.

Not really, I thought of it more as a learning device, although it is fun to fool around with it.

Yes, I was more intrigued with the machine as such than as a teaching help.

Sort of, I was interested to see how it would help me learn.

It was something quite novel, and I did doubt its value.

Yes, it was a new toy to play with.

Yes, because it was fun, a new toy.

Yes, of course. It was something new.

Somewhat, yes.

Somewhat.

2 yes's.

4 no's.

22b. QUESTION:
Do you consider PLATO a gadget now?

RESPONSES:

Absolutely not, I know that PLATO has a great potential to take over all teaching aspects of this and any other course.

I am in Math. Ed. and I am interested in how computers can be used in education and that is why I got into PLATO.

Yes, a very good, useful educational tool; I suppose I consider it more of a tool than a gadget.

I still like the gadget better than the tape but I really believe it is very helpful.

No. I feel that I have a personal relationship (if that is a valid comment) with PLATO.

Only in the sense that it is still "fun" to use.

No, it was very valuable as a tool for learning.

Definitely not! It's a fantastic way to learn.

No! It is a great learning tool.

No, not at all.

No, a learning toy.

6 no's.

23. QUESTION:
Do you think PLATO serves as a valid educational tool?

RESPONSES:

Yes, because a student is actively involved with the learning process and the lesson he is working on, instead of passively listening to a lecture or something. Naturally, there are students who would not "learn" in any situation, but I feel that PLATO would, in most cases, at least hold their attention, and thus they may become more deeply aware of the lesson, instead of perhaps just sitting through a lecture.

Yes, PLATO is very helpful in visualizing the structure and relationships between amino acids and DNA. It is a great help in illustrating development and changes that occur over time.

Yes, it is far more stimulating than a lecture type presentation, but it needs more information in it to answer more questions. Sometimes I felt that I was being programmed. I would have wanted to control PLATO more.

Yes, as I said before I think PLATO has the possibility of easily teaching any subject.

Yes, I think it is an excellent additional tool to help in the teaching of a factual subject, along with a teacher.

Yes. It's like having a live lecturer in front of you, and getting personal attention any time you want it.

Yes, because it provides a different type of learning and in my experiences it seemed more helpful than just taped material would.

Yes, if supplemented with the quiz section and the tape or better yet, a script of the tape.

It is a lot more interesting than the tape, and saves time when experiments are presented.

Yes, it has helped me learn Biology much faster.

Yes, it helps to see things not clear on the tape.

Yes, in 100 level courses.

Definitely.

4 yes's.

24. QUESTION:
Did you find the use of PLATO in Biology 100 a worthwhile experience?

RESPONSES:

Yes, the most helpful thing was the assimilated slides because it gave us a chance to actually visualize what was happening. This was important because often it was difficult to understand a concept solely on the explanation. The quizzes and questions were also very helpful as they let us know that we really understood the material.

Yes. I think I learned and understood the concepts much better than I would have just from the tape.

Yes, from the mechanical point of view as well as from a point of understanding the material better.

Yes, it made the material more interesting than it would have been if I had used only the tape.

Yes, I've listened to both tape and PLATO and PLATO has the tape beat tremendously.

Yes, very much so. I feel I have also learned about computer assisted education.

Yes, I enjoyed using PLATO to study the material of this course.

Yes, the information was interestingly presented.

Yes, it made an interesting course more interesting.

Yes, it was the best part of the course.

7 yes's.

25. QUESTION:
Would you enjoy taking more biology with the use of PLATO?

RESPONSES:

Yes, but I would not like to have much more technical biology, though if I had to, I would prefer to have it on PLATO.

Yes, but I would like to see the PLATO times changed to the evenings so that I could take Biology 101 next semester.

Yes, and I hope I can take PLATO again next semester.

Yes, I hopefully will use PLATO to study Biology 101.

Yes, I would also like to do more experiments on it.

You took the words right out of my mouth.

Yes, at least 101.

Yes, definitely.

Yes, very much.

8 yes's.

26. QUESTION:
Would you enjoy taking a biology course in which all information came from PLATO?

RESPONSES:

Yes, in a general biology course, but if I were to go on to higher biology, I think that actual lab work to supplement it would be necessary to really understand research techniques, as well as factual material.

I don't think so. I think that there is a need for the tape. Hearing a voice breaks up the monotony that all PLATO would cause and vice versa.

Personally, I like to do some of the experiments in the lab saving only the most tedious ones for PLATO. It gives me a better feel for it.

No. I think that having someone explain something to you can be helpful. I especially liked when we used PLATO and the tape simultaneously.

If it were presented in many diverse ways; part of the "fun" of PLATO is the diversification. PLATO as it is now.

No, I think that the face-to-face relationship with other "humans" (no offense to PLATO) is very important.

No, I would rather be able to have discussions and something I could take home and study, besides notes.

Yes, this would give me the total control of the rate at which I could study in the course.

Yes, I find it much easier to understand than the tapes and more fun to do.

Yes, although the taped material along with PLATO does give some more variety.

Yes, with a little personal contact from instructors.

No, I think the quiz section was also very important for me.

No, the tape supplied more information.

I am not sure.

2 no's.

1 yes.

27. QUESTION:
Would you like to see PLATO used in courses other than biology?

RESPONSES:

Yes, I suppose it could be used in most basic level courses, especially language and grammar, math, history, etc. However, I do not feel the discussion section can be eliminated.

Yes, I think it is especially good for math and sciences, languages and introductory courses in other fields that are mainly factual in content.

Yes, but not so much that PLATO replaces the teacher.

Yes, I've had it with languages and it helps a lot.

Without a doubt.

11 yes's.

28. QUESTION:
Did you find PLATO a waste of your time?

RESPONSES:
Not in the least. It took me a lot less time to finish a PLATO lesson than it took many others to finish the regular tapes.

Sometimes, but mostly for mechanical reasons which had nothing to do with the pedagogical approach.

Definitely not! But I do wish that it hadn't been down the few times it was this semester.

No, because I learned how a computer can actually aid in education.

No, I feel I spent less time on biology than if I had not used PLATO.

Not at all. It saved time.

No definitely not.

Not at all.

9 no's.

29. QUESTION:
Do you think you learned information using PLATO?

RESPONSES:
Yes, because many facts stuck in my mind because I could visualize them on the screen or in relation to a slide, where on a tape these things might just pass by.

Yes, PLATO was a well needed change from listening to the tapes. This change brought an increase in my attentiveness to the material.

Yes, as I said before, I learned much more than I would have from the tape alone.

Yes, I could understand and recall the information much more easily.

Yes, definitely.

Without a doubt.

11 yes's.

30. QUESTION:
Do you feel at a disadvantage in quiz section with other students in the course who did not use PLATO?

RESPONSES:
No, I notice no difference at all, for sometimes I have added information from PLATO or sometimes other students have remembered a sentence or so of Dr. Kieffer's tape that I didn't have, but that is very rare and involves minor details.

No, although occasionally they heard things I apparently missed. Also, because I had PLATO when I was scheduled for GAS and then had afternoon classes at the times of the other GAS sections, I was unable to attend GAS.

No, and in some cases I feel that the animated slides gave me a better understanding of a concept than the other students got from the tape.

No, although I think the quizzes on PLATO gave me no real advantage over the other students, I don't think I was at any disadvantage either.

Sometimes when a bit of material was on their tapes and not on PLATO, but usually it works out.

No, I feel I am better prepared than the other students.

No, in fact much of the time I think I was at more of an advantage.

No, in fact I felt at an advantage.

No, I really think that I had the advantage.

No, I felt an advantage.

No, I feel at an advantage.

Not at all.

5 no's.

31. QUESTION:

What are your comments on the "rigid" time schedule into which we are "locked"?

RESPONSES:

It actually hurries me too much. I am always worried that I won't have enough time to finish and I consequently try to hurry through the lesson just to make sure that I will finish. I would like to have spent more time on many of the lessons, and especially the experiments. In fact, many times I didn't have enough time to take many of the quizzes.

That is the only complaint I have, for sometimes if I have been ill or have another appointment, it is hard to work everything in on time. One thing is nice though, if I do make it to class in the rigid time limit, I am guaranteed a booth because I'm on PLATO.

I think it was good in that we were scheduled to come in at a certain time each week, but I think that it would be better if a 2 1/2 or 3 hour block was available because sometimes time was running short and enough time could not be spent on different things, usually at the end of the semester.

I like it because I MUST get my biology done on a certain schedule, I can't put it off. But if PLATO is used for all students in Biology 100, the same setup as the tapes should be used.

I didn't like it especially since I was split Tuesday-Thursday but it was better than a waiting list. I'm sorry it has such a rigid schedule because it doesn't fit in next semester.

The time period is of adequate length for most of the lessons. The only problem is that some times you can't make the lesson and you are penalized by having to listen to the regular tape.

I don't mind since it fits my schedule, but I can't work PLATO in next semester and, as I said before, if PLATO could be at night it would be much better.

That is the worst part of the whole program...having a rigid start time is alright, but I think it should be longer than a two-hour period.

I liked it. I probably would have used those times anyway. This way I didn't have to wait in line or reserve a booth ahead of time.

It presents a problem, I sometimes had to miss and listen to the regular tapes, I also was unable to attend GAS because of it.

I like it but also realize that we have the best time of the week. I'm sure I wouldn't like 6 to 8 p.m.

I like it because I know there is always a booth and I have to go instead of procrastinating.

I didn't mind it at all, because I didn't have to wait for a booth.

At least you know you have a booth.

We should be given a larger time slot.

Inconvenient.

Crummy.

32. QUESTION:

Is (are) there any particular technical dislike(s) you have about PLATO?

RESPONSES:

I have a particular dislike for every piece of equipment in this room. Right now I can barely read this screen and I've had this problem many times...that's where the waste of time comes in. And the tape equip- is just as bad or worse.

I didn't like the fact that I couldn't get more than 1 line of type when I wanted to comment, but that has changed. (At least in this lesson).

Yes, tell the telephone company to stop messing with the wires. Actually, the only technical dislike I have is when something didn't work.

Sometimes the screen is blurry or other classes "take" the screen and we have to wait, which is discouraging, especially because we have such a short time.

Besides the regular TV problems encountered during a lesson, I think the PLATO program was run very well.

Sometimes the screen is not centered correctly. Words run-off the edge. Some screens are not clear.

Not really although it does break down sometimes, but that's to be expected.

Only that I haven't mastered it and that there is often a bad screen.

The one time I had to wait 20 minutes for a booth but that only happened once.

Just that sometimes you can't be sure if it will be running.

Not with PLATO, but the booths often don't work.

Yes, the damn thing keeps breaking down.

Usually screens are fuzzy or wavy.

When working correctly, no.

Only its frequent breakdowns.

Only when it is done.

No.

33. QUESTION:

Is (are) there any particular educational dislike(s) you have about PLATO?

RESPONSES:

I feel that the material and the quizzes can be fitted better to the list of our sometimes abstract objectives OR the objective and quiz section quizzes can be clarified. I favor the second change.

I think it is a very helpful teaching aid but it should remain an aid and not become a teacher as a person.

That more information can't be programmed on it. Also, I have the hang-up of not being able to spell.

13 no's.

34. QUESTION:
Do you feel PLATO has a "future" in education?

RESPONSES:
Definitely, I think that PLATO-type programs will eventually be the main if not the only teaching method used in the future.

Yes, I think education will be almost solely taught by computers.

Yes as a supplement to the classroom but not to replace it.

Yes, very definitely, it can be very important in the future.

Yes, a bright one.

Yes, for certain.

Yes, definitely.

9 yes's.

35. QUESTION:
Are you going to take Biology 101 next semester?

RESPONSES:
13 yes's.
3 no's.

36. QUESTION:
Are you going to take Biology 101 with PLATO (if possible) next semester?

RESPONSES:
Yes, but I don't think that I will be able to.

Yes, I have arranged my schedule for it.

I would but it's not possible.

11 yes's.

2 no's.

37. QUESTION:

Knowing what was presented on PLATO this semester (and perhaps knowing what type of material will be offered next semester in Biology 101), what most would you have liked to see (or would like to see) on PLATO that wasn't offered?

RESPONSES:

Perhaps more graphs and charts and things when the lesson is that kind. Also since PLATO can do hypothetical experiments some of that kind would be interesting, since we can't do them in the real lab. This would especially apply to next semester and the type of things discussed.

More experiments done on PLATO, because many experiments are based on the interpretations of the results rather than how the results were obtained.

Just more material on PLATO and less on the ***** tapes. I think the presentation of material was much clearer on PLATO.

Just more of the unit on PLATO and less on the tape. And perhaps a written script of all the material in the unit.

More experiments, more interesting side-comments, but I feel sorry for the programmer. Isn't that a lot of work?

More information like even on the tape PLATO information was too simple or repetitious.

I think more diagrams on the surface to volume unit.

More animated slides and more experiments on PLATO.

More learning through questions and experiments.

More detailed information for the subjects offered.

More experiments and some different, funny comments.

More help if asked for, and more experiments.

A variety of games.

More questions.

38. QUESTION:

What did you personally like best on PLATO this semester?

RESPONSES:

The quizzes and questions because I knew when I knew the material that way. Also it was fun to fool around during the experiments.

The experiments in particular but I liked the whole general idea of learning on the computer.

I could go at my own speed by myself. The different approach made the course more interesting. I think PLATO is more fun than lecture or tape.

The simulated experiments and the organization of the lesson on the screen (outlines, quizzes, etc.).

The questions and the experiments, the heat graphs and the respirometer.

The slides and other visual aids it offered over just hearing something from a tape.

I like the clarity and the brevity with which the material was presented.

I liked the developing embryo and similar moving diagrams.

I can't remember a specific unit that I liked best.

The SA/V relationship and heating the houses.

Overall, it was great.

The experiments.

Animated slides.

Experiments.

39. QUESTION:
Now that you've gone through a semester using PLATO, and knowing what you do now, would you still have signed up in September to use PLATO?

RESPONSES:
17 yes's.

40. QUESTION:
In the future, do you think PLATO should be available mainly to:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. biology students who need help only	0
B. students who want to go into biological problems in greater depth	0
C. all students, no matter what their reasons for taking Biology 100	14
D. other (explain)	2

COMMENTS:
I agree with C, but also for students who are interested in CAI.

Any student, no matter what their reasons for taking Biology 100.

41. QUESTION:

If you were in a position of authority to decide whether PLATO should be added as a regular part of Biology 100 for all students, would you recommend its use in the course?

RESPONSES:

Yes. Of course the facilities and the time period would have to be increased greatly, but if this were possible I would.

Yes, but the students should have the individual choice. Different students like different types of teaching techniques.

Yes. PLATO is invaluable.

Very definitely.

Yes, strongly.

10 yes's.

A2. PLATO Questionnaire Responses Spring Semester 1970-71.

1. QUESTION:
Did you find simple fact presentation (reading) on PLATO:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	7
B. helpful	5
C. not very helpful	1
B. totally useless	0

2. QUESTION:
Do you think that the amount of simple fact presentation on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	8
B. be decreased	1
C. remain the same	4

3. QUESTION:
Did you find question-answer type of material on PLATO:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	11
B. helpful	2
C. not very helpful	0
D. totally useless	0

4. QUESTION:
Do you think the amount of question-answer material on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	10
B. be decreased	0
C. remain the same	3

5. QUESTION:
Did you find the use of programmed experiments (such as the puzzle, mouse-training experiment, or population growth curve) on PLATO:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. very helpful	10
B. helpful	2
C. not very helpful	1
D. totally useless	0

6. QUESTION:
Do you think the number of programmed experiments on PLATO should:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. be increased	11
B. be decreased	0
C. remain the same	2

7. QUESTION:
Did you find PLATO too impersonal?

RESPONSES:
No, because a tape is just as impersonal though it's someone's voice. The little comments that accompanied the answers helped too.

No, the tendancy is to consider PLATO to be something more than just a machine.

No, Dr. Kieffer talked on the tape which made PLATO personal, not impersonal.

I like having a TA around when I need him, but PLATO is alright otherwise.

Not at all since I could go at my own speed.

No, it was better than a tape or lecture.

No, less than just the tape.

6 no's.

8. QUESTION:
At the beginning of the year, did you consider PLATO to be a gadget?

RESPONSES:
No, I didn't think it was a gadget - I was kind of curious about it because I'm interested in computers.

No, I had used it before for a language - you have a lot more imagination.

Somewhat, but not totally a gadget.

5 yes's.

5 no's.

9. QUESTION:
Do you consider PLATO a gadget now?

RESPONSES:
Not at all, I believe it has great potential as a learning device.

Not as much.

11 no's.

QUESTION:
Do you think PLATO serves as a valid educational tool?

RESPONSES:
Yes, by seeing experiments and processes by animation it is easy to visualize confusing concepts.

Yes, it is an excellent and valuable educational tool.

Yes, extremely useful.

10 yes's.

11. QUESTION:
Did you find the use of PLATO in Biology 100-101 a worthwhile experience?

RESPONSES:
Yes, note-taking was easier than rewinding the tape. PLATO also explained unclear concepts to me.

Yes, as my first experience with CAI, I found it very enjoyable and useful.

Yes, very much so.

Extremely worthwhile.

Definitely.

8 yes's.

12. QUESTION:
Would you enjoy taking more biology with the use of PLATO?

RESPONSES:
No, but I don't want to take more biology without PLATO either. Anything after Biology 100-101 would be a let-down.

I wouldn't enjoy taking more biology with or without the use of PLATO (I enjoyed this year, but 1 year's enough).

I like PLATO, but I don't want more biology.

If I would take more biology, I would like to use PLATO.

Yes, definitely.

7 yes's.

1 no.

13. QUESTION:
Would you enjoy taking a biology course in which all information came from PLATO?

RESPONSES:
Yes, but the arrangement now used is very good because material is presented in several ways: tape, written, PLATO.

Yes, as long as there was variation in how it's presented - not only fact presentation.

Yes, I realize programming is a problem, but I think the PLATO program is just at an elementary stage.

Yes, if I also get a bibliography for further reading if I'm interested.

I would like to try.

No, the change from one media to another is better - I would like more on PLATO though.

No, I still like G. A. S. and that walking talking man.

4 yes's.

2 no's.

14. QUESTION:
Would you like to see PLATO used in courses other than Biology 100-101?

RESPONSES:
Certainly.

Yes, definitely.

11 yes's.

15. QUESTION:
Did you find PLATO a waste of your time?

RESPONSES:
No (what a dumb question).

12 no's.

16. QUESTION:
Do you think you learned information using PLATO?

RESPONSES:
Yes; often the tape puts one to sleep because of the fact that all one does is listen; where on PLATO there were things to read and questions to answer, so one doesn't miss as much as he can while listening to the tape.

Yes, the change from the tape was refreshing.

Yes, a lot more than just listening to tapes.

10 yes's.

17. QUESTION:
Do you feel at a disadvantage in quiz section with other students in the course who did not use PLATO?

RESPONSES:
Not really, though at times students mentioned a specific example on the tape that may have been skipped on PLATO, but really, there was more of an advantage.

No, many times I am at an advantage because I have materials available to me which others don't.

No, in fact, many times I felt superior in that I knew more knowledge and could explain it better than they.

Occasionally, but I have also felt at an advantage too.

Not at all - in fact many times I had an advantage over them.

No, possibly at an advantage.

No, even an advantage.

No, on the contrary.

Not at all.

4 no's.

18. QUESTION:
What are your comments on the "rigid" time schedule into which we are "locked"?

RESPONSES:
I don't like it. It shouldn't be rigid. If you have Thursday quiz and don't finish PLATO on Tuesday, you lose.

Bad, because it restricts the number of people who can use PLATO, and good, because it keeps attendance high.

I had no problem scheduling my other classes around PLATO time, but that was because I knew ahead of time what the "rigid" schedule was.

It helped me organize my time, but I would think a less rigid schedule would be helpful, so more people can take the PLATO section.

It would be better if it was more open, but it was nice to always have a booth reserved.

I'm the type of person who needs it, but I guess it's slightly annoying at times.

At least you know you'll always have a booth at that time.

It would be nice to have more flexible times so more could participate.

I like it because we know there will be a booth.

It's unfortunate one can't go in and do PLATO anytime.

Only inconvenient once in a while.

19. QUESTION:
Is (are) there any particular technical dislike(s) you have about PLATO?

RESPONSES:
Sometimes it's hard to see the screen because of lighting. Sometimes (it happened more at the beginning (2 or 3 times?)) the entire thing broke down. Sometimes fuzzy screens.

Screens could be clearer and centered more correctly so words don't run over the side.

Yes, PLATO needs better TV sets and better awnings on the sets to make for less glare from the lights.

The screens are hard to "read" a lot of the time. Also the writing tends to go off the screen to the left.

Just break-downs: Maybe also if co-ordination of tape and PLATO was increased.

Sometimes the words are half off the screen on the sides.

The picture is bad at times.

The screens are not always clear.

No - only when it's not working.

Poor video display.

2 no's.

20. QUESTION:
Is (are) there any particular educational dislike(s) you have about PLATO?

RESPONSES:

There was definitely not enough PLATO this semester. Also, it would have been useful in many cases to have been able to press "Term" and get a brief definition of an unknown term or troublesome concept.

It may become boring and depersonalized if the entire course was on PLATO. However, the way Biology 100-101 is set up now, still with quiz sections, etc., it's more of an educational "like".

There shouldn't be a course taught so completely on PLATO that there isn't a quiz section because sometimes questions can't be answered by PLATO.

The material presented on PLATO could be increased and varied as to presentation (i.e. change in programming).

Not unless it were used solely without any other teacher.

Not enough HELP's or TERM's.

7 no's.

21. QUESTION:
Do you feel PLATO has a "future" in education?

RESPONSES:

Yes, my instructor in Architecture 199 is thinking of writing programs to use on PLATO in basic design studios (Arch. 171, 172, 271, 272).

Yes, with teachers available, much like are available in the lab, to help with questions.

11 yes's.

22. QUESTION:

Knowing what was presented on PLATO this past year, what type of material or lesson ideas would you have liked on PLATO that weren't presented?

RESPONSES:

More experiments because although we were supposed to get a "taste" of lab experience, the important part is interpreting the results - so, if PLATO ran the experiments, the data gained would be more valuable than working the experiments and getting "bad" data.

More experiments could have been presented. I think the experiments which were presented were more educational than the ones done in lab.

More programmed experiments and more programmed demonstrations of the lesson.

More charts, diagrams and experiments (particularly in Biology 100).

More experiments and hypothetical situations.

More information in regards to the objectives.

More on environmental systems.

More experiments.

23. QUESTION:

What did you personally like best on PLATO this past year?

RESPONSES:

I liked everything about PLATO except for a few mechanical complaints. The thing I liked best about PLATO was that it made studying more enjoyable. I'm not sure why that was. Part of it was due to the fact that PLATO is a very good educational system. Part of it was due to the fact that I was a member of a special group using a new method of learning.

I liked the simulations and the games because it gave a chance for experimentation - I also liked the questions after a section of material because it really tested understanding of the material.

I liked the unique way it presented certain topics and also the tie-in between the "games" and the factual material.

The mouse training experiment. I feel I actually learned very much from it.

The "mouse" was the most interesting but not the most useful. The graphs on the population control unit were most useful.

Most definitely it was the mouse-training experiment.

Diagrams that move, such as fetus formation.

The experiments.

The learning puzzle and the heat experiment.

Games (the mouse, population curve, etc.) and experiments.

I didn't have to listen to the tapes as much.

The experiments (especially that mouse).

The programmed demonstrations and experiments.

24. QUESTION:
Now that you've gone through a year using PLATO, and knowing what you do now, would you still have signed up in September to use PLATO?

RESPONSES:
Yes, and with more eagerness.

Yes, definitely!

Emphatically, YES!

10 yes's.

25. QUESTION:
If you were in a position of authority to decide whether PLATO should be added as a regular part of Biology 100-101 for all students, would you recommend its use in the course?

RESPONSES:
Yes, I don't think it would hinder any student in any way.

Yes, but I think it's expensive and might be better for other courses like math, psychology, languages.

Yes, tapes could still be used as supplement because of the time factor, but I think PLATO is very beneficial.

Yes, very strongly.

Yes, no doubt.

Definitely.

7 yes's.

26. QUESTION:

In the future, do you think PLATO should be available mainly to:

CHOICES	NUMBER OF STUDENTS RESPONDING
A. biology students who need help only	0
B. students who want to go into biological problems in greater depth	1
C. all students, no matter what their reasons for taking Biology 100-101	11
D. other (explain)	1

COMMENTS

First available to students that need help. Keep a certain number of PLATO stations open at certain different times for this. Then have it available to all students. Someday, all students will be taught by PLATO.

27. QUESTION:

Are there any comments you might have concerning PLATO, its use in Biology 100-101, or the manner in which the experimental PLATO program was carried out?

RESPONSES:

There is nothing to say but that PLATO was an all around excellent experience. One suggestion to improve the presentation on PLATO would be to have a section on the PANEL which could be accessed at any time, containing diagrams which are now presented in the book. This would allow the student to follow the tape continually (not having to stop and fumble through the manual) and also to have the use of sequence diagrams. I am 100% satisfied with my experience with PLATO so far.

This past year has showed me a lot about computer-based instruction. I hope the work on CAI will continue, for its future in education is almost unlimited. Thanks for the opportunity to use PLATO.

I feel that this has been a highly successful year for PLATO and wish it good luck. I hope PLATO will be continued and will be on a larger scale than this year.

I think PLATO was very effective in teaching Biology 100-101 because it cut-out some unnecessary information, while providing a better understanding of the material.

It would be helpful if we knew in advance if there was to be no PLATO lesson in a specific unit.

Just that you have a lot of imagination and after some courses I've had it's refreshing.

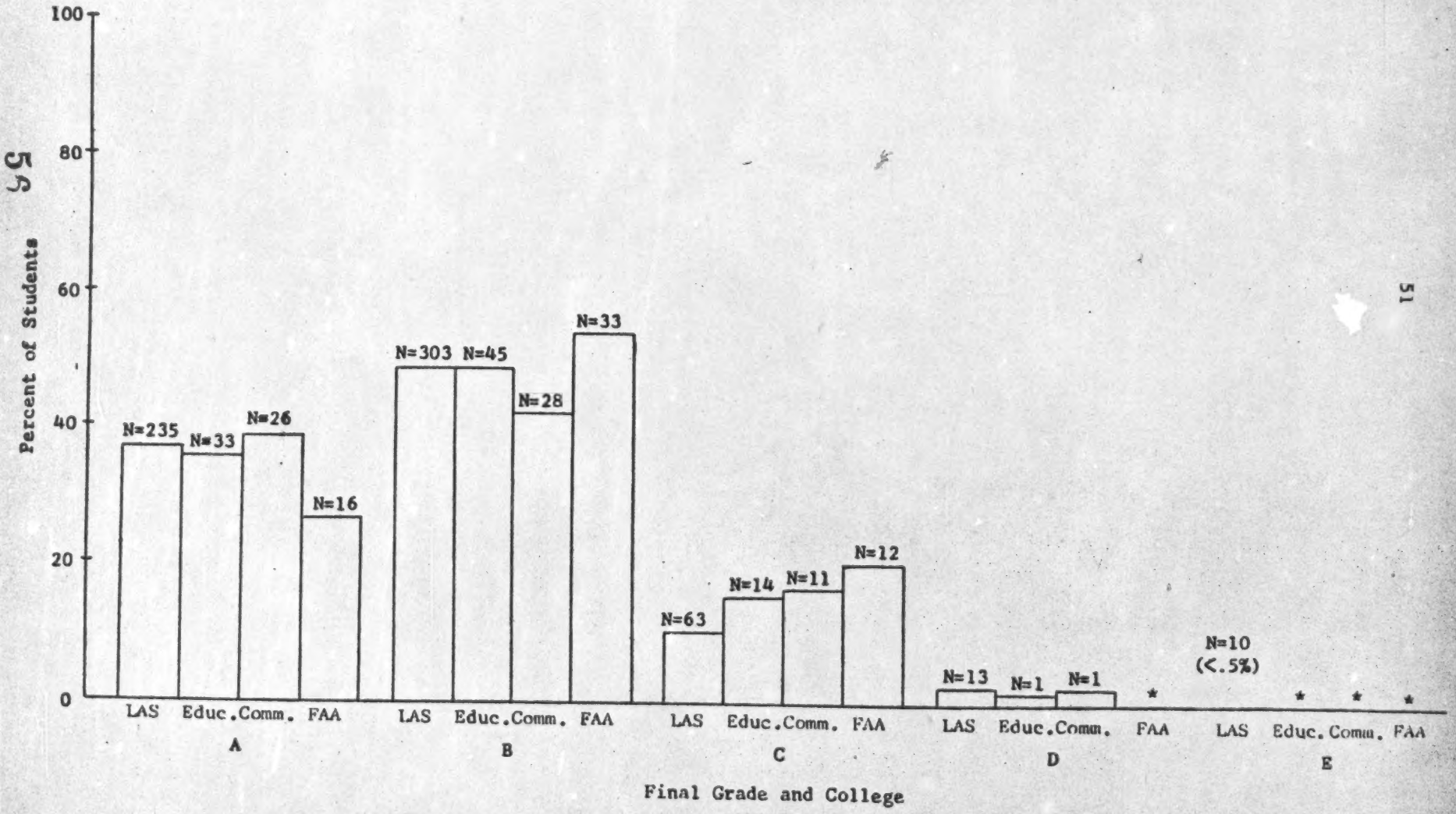
What more can I say, except I'm glad I took PLATO.

It was a wonderful experience working with PLATO.

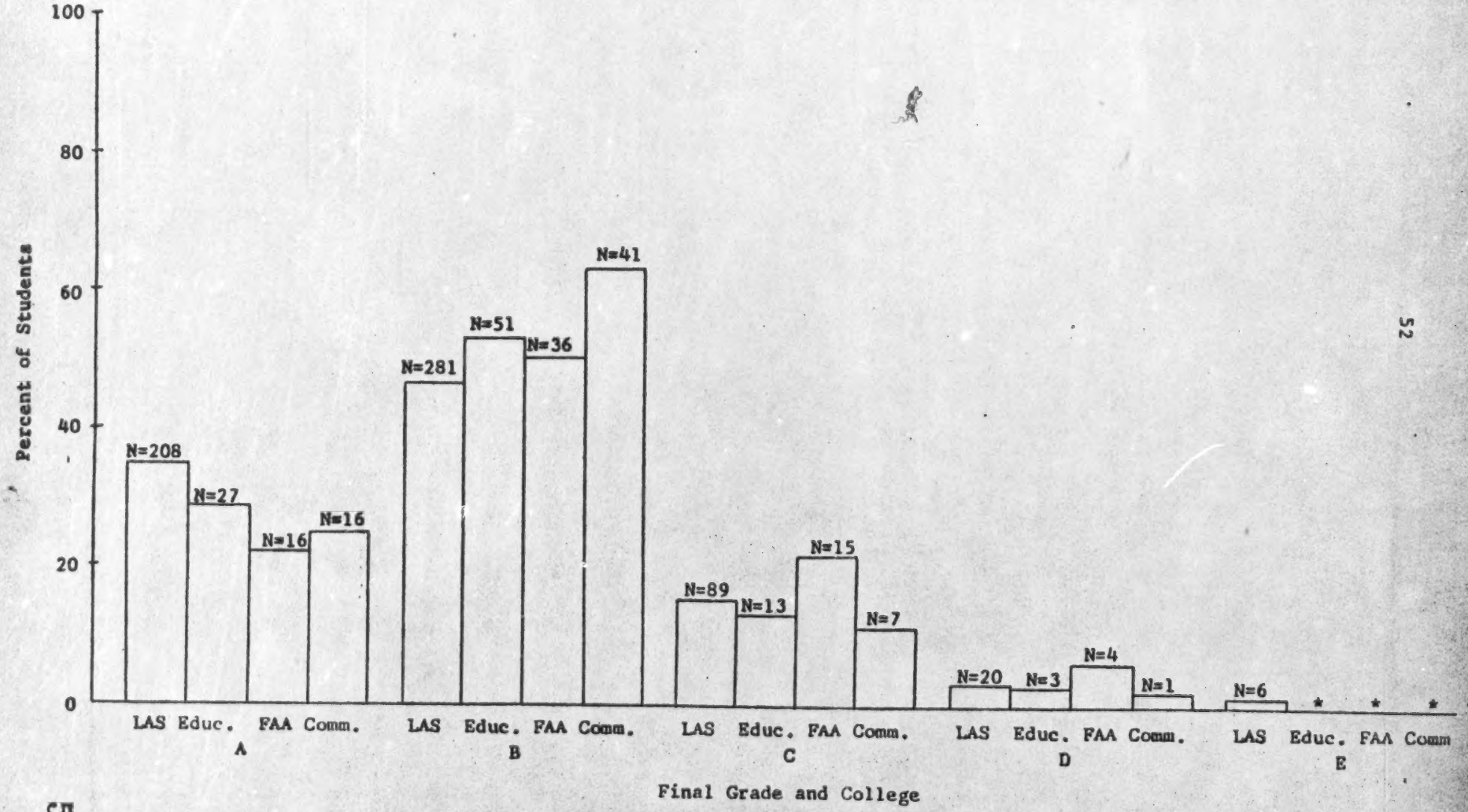
I enjoyed it.

B. The following graphs are referred to in the body of the paper, but the information they carry has not been deemed important enough to place in the DATA-RESULTS section and are included here only as reference. (Asterisk indicates no data in catagory.)

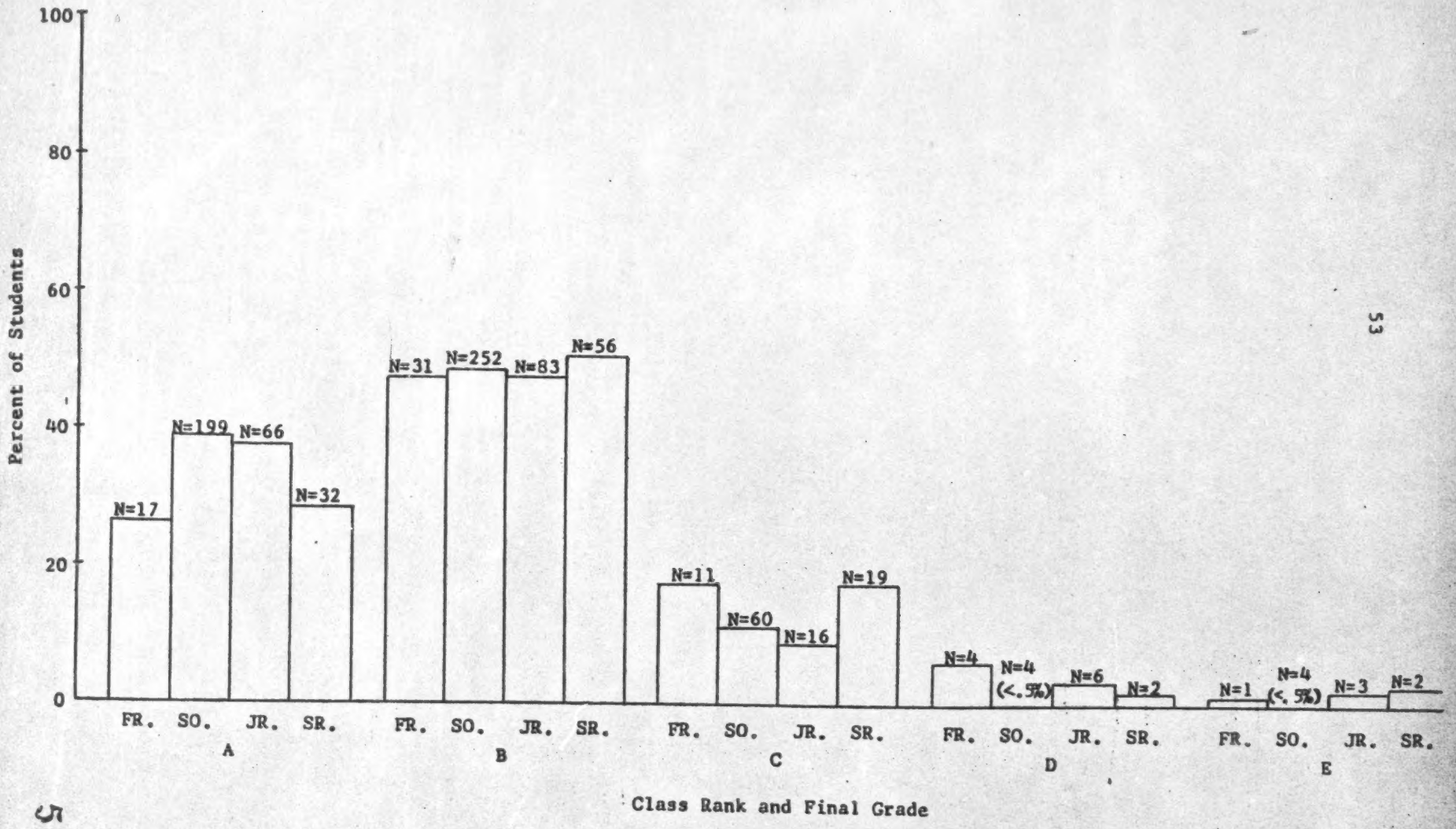
Graph XI. Comparison of College Enrollment and Final Grade Received Fall Semester 1970-71.



Graph X2. Comparison of College Enrollment and Final Grade Received Spring Semester 1970-71.



Graph X3. Comparison of Class Rank and Final Grade Received Fall Semester 1970-71.



Graph X4. Comparison of Class Rank and Final Grade Received Spring Semester 1970-71.